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ODP 82-1394

17 September 1982

MEMORANDUM FOR: Executive Officer to the DDA

FROM: [redacted] 25X1
Acting Chief, Management Staff,
Office of Data Processing

SUBJECT: FY 1985 Research and Development Program [redacted] 25X1

REFERENCE: Your Multiple Addressee Memorandum, Same Subject, dtd 23 August 1982 (DD/A 82-2062)

Attached you will find the ODP ranking of R&D problem statements as requested in the referenced memorandum. I have been appointed action officer for the FY 1985 R&D program in lieu of [redacted] due to his very heavy commitments with SAFE and other activities. If there are questions concerning our rankings or on other R&D program matters, please do not hesitate to call me on [redacted] 25X1 25X1

/s/

[redacted] 25X1

Attachment: a/s

cc: A/D/ODP
DD/P/ODP
DD/A/ODP
C/SPS
C/SPD/P/ODP

ILLEGIB

Cy sent to [redacted]
DDA OC PAS/ASG
Rm 2640, Hqs

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Attachment

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FY 1985 ODP R&D PROBLEM STATEMENTS AND RANKINGS

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ADMINISTRATIVE - INTERNAL USE ONLY

17 September 1982

FY 1985 R&D PROBLEM STATEMENTS

ODP RANKING SHEET*

1. Communication Strategies
2. Computer Security
3. Low-Cost Tempest Technology
4. Database Front-Ends to Improve User Accessibility
5. Computer System Configuration Analysis**
6. Approaches to Requirements Analysis and Definition
7. User Satisfaction
8. Management of Large Software Development Contracts
9. Distributed Cartographic Database
10. Mass Storage

*Ongoing requirements, except as indicated.

**New problem statement.

ADMINISTRATIVE - INTERNAL USE ONLY

Off. Designator/Location SPD/ODP
Telephone (Black) [redacted]

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Rank____ of____

Problem Number _____

Office: ODP

Title: Computer Security

Problem Description:

a. Current and planned systems within ODP produce "audit trails", records of system activity and user access. ORD has been investigating the feasibility of determining inappropriate use of computers by detecting changes in useage patterns as reflected in the audit trails. Techniques of this sort need to be evaluated and refined in a continuing effort, since audit information represents a sound means of assessing damage and possibly detecting misuse.

b. Encryption of data which is randomly accessed and stored is very difficult to do in a dynamic environment. Methods for cheaply and accurately encrypting data which is randomly accessed and stored should be investigated and tested.

c. Methods for filtering textual data in a distributed computer network are required. Data security by system, classification, file status and/or unusual sensitivity should be addressed. The risks of unauthorized access or spillage need to be assessed and probability estimates of secure storage and access for each method should be made.

d. Techniques are required (technical, procedural, contractual) for detecting unauthorized modifications of ADP equipment or software. These modifications might occur at the factory, in transport or during maintenance, as is sometimes required, by uncleared vendor personnel. The potential for unauthorized modification is high and the probability of detection through existing procedures unfortunately low.

Time Requirement:

Need as soon as possible. Research to be conducted on a continuing basis.

Background/R&D History/References:

Computer Security has been a continuing requirement of both the Offices of Data Processing and Security. There are currently ongoing efforts in data filtering and audit trails, and these should be continued.

Benefits/Description of Output:

Objectives are:

a. Identification/detection of unauthorized activities.

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b. Secure random access data storage in potentially hostile environments and for continuity of government.

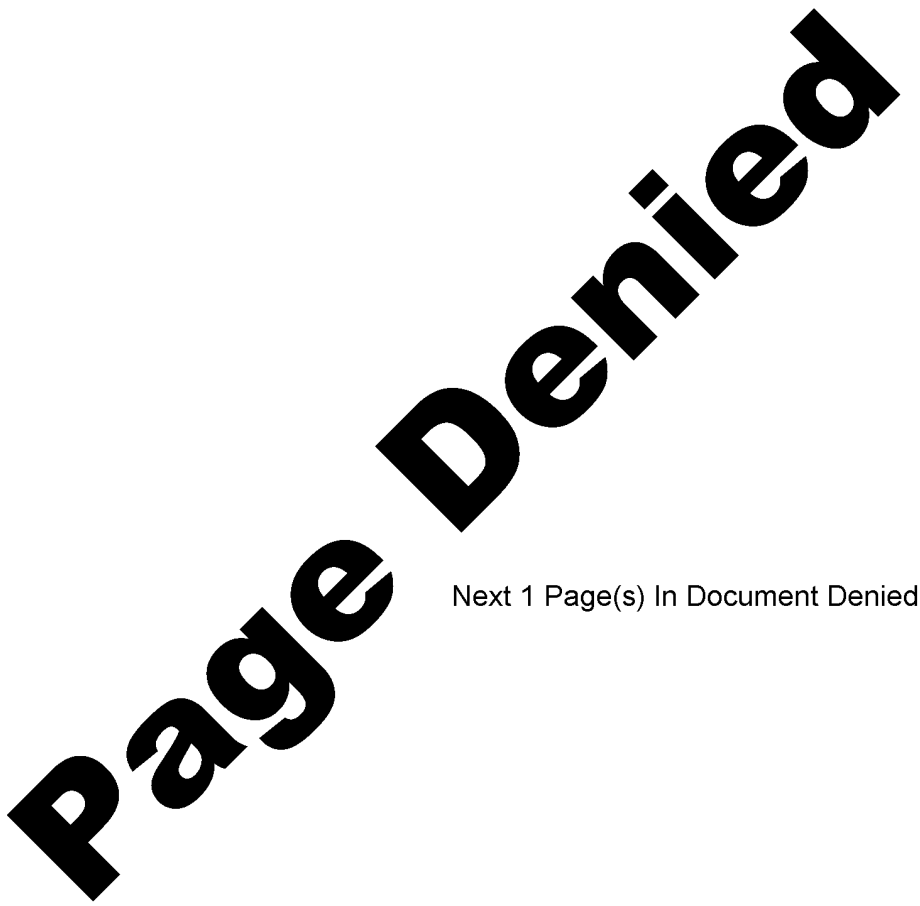
c. Secure file and data sharing.

The output from this research would be reports, outlining appropriate techniques and algorithms, as well as computer programs and prototype applications.

Policy Basis/Justification:

DCID 1/16

Contact: [redacted] 25X1



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Rank____ of____

Problem Number_____

Office: ODP

Title: Distributed Cartographic Database

Problem Description:

Several new ODP systems will require the ability to graphically portray intelligence information superimposed with maps. The characteristic of the communications requirements for these applications is that a relatively high proportion of the information that needs to be sent to graphic terminals is (relatively) static and unclassified cartographic data. These applications would benefit significantly from a mechanism which would allow the geographic data to be stored in the graphics terminal, thus significantly reducing the amount of information which needs to be communicated.

Time Requirement:

Near term.

Background/R&D History/References:

This problem statement was first surfaced in the FY84 R&D planning exercise. The application of graphics to these applications is currently under development.

Benefits/Description of Output:

A successful and inexpensive implementation would improve our ability to enhance the presentation of geographically-oriented data.

Policy Basis/Justification:

ODP has the responsibility for maintaining a state-of-the-art computer facility for use by Agency components.

Contact: [redacted] STAT

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Problem Number_____ Rank____ of____

Office: ODP

Title: Database Front-ends to Improve User Accessibility

Problem Description:

ODP currently makes use of two database management facilities (RAMIS and GIMS) for almost all applications requiring generalized storage and retrieval of formatted data. There have been several significant developments in the area of human interface to DBMS systems which could potentially improve the useability and accessibility of the database applications. We need to develop an assessment of the new technical advances in this area, as well as the feasibility of applying these techniques to our environment.

Time Requirement:

Continuing problem.

Background/R&D History/References:

This subject has been addressed by previous R&D efforts, but it has not been focused on the existing systems and terminal in ODP.

Benefits/Description of Output:

Data base management is essential to the future of Agency computing and improvements in useability would be beneficial to a wide range of ODP customers. A report describing the potential for application of the techniques would result from the research.

Policy Basis/Justification:

ODP has the responsibility for maintaining a state-of-the-art computer facility for use by Agency components.

Contact: STAT

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PROBLEM NUMBER _____ Rank _____ of _____

Office: ODP

Title: Computer System Configuration Analysis

Problem Description:

ODP systems engineering personnel are required to evaluate candidate computer systems configurations to determine cost-effective approaches to satisfying system requirements and to improve system performance (i.e., system tuning). Techniques currently available include engineering judgment, benchmarking, analytic modeling, simulation, etc. The configurations in question are extremely complex and involve large IBM or IBM-compatible mainframes and peripheral equipment, primarily disks, such as the IBM 3380. The operating systems involved are IBM/MVS or VM. Time and resource constraints require that modeling tools, in lieu of benchmarking, be emphasized. Such tools should be able to predict key system performance parameters; e.g. response time, turnaround time, maximum number of concurrent users, throughput, etc. Emphasis should be placed on the VM timesharing system, since that is a current performance bottleneck area.

Key requirements for modeling tools are that they be accurate, require only limited data collection and be easy-to-use. Analytic methods would be preferred to simulation methods due to their parsimonious use of computer resources and the relative rapidity with which one can analyze multiple configurations. Existing approaches are believed not adequate for computer systems and configurations of practical interest to ODP.

Time Requirement: Continuing Problem

Background/R&D History/References

ODP Engineering Division is continually exploring available techniques in the commercial and academic world. ORD has begun a study effort with the University of Maryland in this area.

Benefits/Description of Output

Benefits are:

a. Potential cost avoidance associated with use of optimal minimum configurations to meet requirements.

b. Potential performance improvements associated with use of optimal configurations resulting in improvement of user productivity and more timely satisfaction of user requirements.

c. Savings in ODP analysis resources for systems configuration and tuning.

Objectives are:

a. Development of validated computer based models for the configuration analysis of complex large scale IBM or IBM compatible computer systems. Emphasis should be on analytic models and VM-based systems.

b. Implementation of the above models on Agency computer systems; documentation and training should also be provided.

Policy Basis/Justification:

ODP has the responsibility for maintaining a state-of-the-art cost-effective computer facility for use by Agency components. (Reference:

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Contact:

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Problem Number_____ Rank____ of____

Office: ODP

Title: Approaches to Requirements Analysis and Definition

Problem Description:

The design and construction of information systems is a complex process, often characterized by misunderstood requirements and expectations, underestimated costs and schedules, and systems which are difficult to change. Progress is being made on several fronts based on increased understanding of the basis for requirements analysis. Some steps of the design process are being codified and languages are being proposed for more precise communications among designers and between designers and requirements analysts.

Time Requirement:

Continuing.

Background/R&D History/References:

This problem statement was first surfaced in the FY84 R&D planning exercise

Benefits/Description of Output:

Any advance in training, tools or techniques would improve the productivity of staff and the quality of the software product.

Policy Basis/Justification:

ODP has the responsibility for developing software in support of Agency and selected Intelligence Community customers.

Contact: Name _____
Off. Designator/Location ODP
Telephone (Black) ____

Problem Number_____ Rank____ of____

Office: ODP

Title: User Satisfaction

Problem Description:

A methodology should be developed such that ODP can more accurately measure the quality of the ADP service it delivers to its Agency and Intelligence Community customers.

Hardware performance measures (e.g., response times, turnaround times, CPU utilization) and availability measures are not by themselves adequate measures of the quality of ADP services. User satisfaction measures are subtle and to-date unquantifiable.

It is envisioned that the literature and outside organizations would be surveyed (e.g., the work of Weinberg and Ethnotech) for methodologies to measure user satisfaction. If existing work were not appropriate for the ODP environment, R&D would be performed to develop new measures and approaches. Some measures might be developed and evaluated with a sample of the ODP customer base.

Time Requirement:

Continuing.

Background/R&D History/References:

This problem statement first appeared in the FY84 R&D planning exercise.

Benefits/Description of Output:

If such measures were available, they could be used to guide ODP managers in resource investment decisions. They could, at least in theory, if used as a management tool, result in better quality of ADP service at the same or less cost. The goal is to develop a methodology such that user satisfaction could be continuously monitored by ODP as part of its overall management.

Policy Basis/Justification:

ODP has the responsibility for maintaining a state-of-the-art computer facility for use by Agency components.

Contact: [redacted] STAT

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Problem Number_____ Rank____ of____

Office: ODP

Title: Management of Large Software Development Contracts

Problem Description:

R&D should be performed which would have as its end result a recommended methodology for the management of large software development contracts. This methodology should be a tool to assist Agency project management offices in delivering software developed under contract, that satisfies Agency requirements and is on time and within cost.

Time Requirement:

Continuing.

Background/R&D History/References:

This problem statement was first surfaced in the FY84 R&D planning exercise.

Benefits/Description of Output:

The execution of large software development contracts in CIA is becoming increasingly more commonplace (e.g., SAFE, CAMS2, NDP). The successful completion of these projects is imperative. The Agency, like most outside organizations, has had only limited success in this area. Any improvement through the use of standardized management approaches, tools, and training etc, would be of great benefit both in terms of cost and operational impact.

It is envisioned that this R&D project would initially be a review of key Agency software development contract experience, a review of similar outside experience and a survey of available management methodologies. New methodologies would be developed if required.

Policy Basis/Justification:

ODP has the responsibility for developing state-of-the-art software in support of Agency and selected Intelligence Community customers. Frequently, external contracting is the only feasible approach.

Contact: [redacted] STAT

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Administrative - Internal Use Only

Problem Number _____ Rank ____ of ____

Office: ODP

Title: Mass Storage

Problem Description:

Technological progress in the storing of massive amounts of data continues to be made. For example, optical disk technology being advanced for video recording holds considerable promise for digital storage. ODP currently relies on more traditional mechanisms for data storage, such as magnetic disk and tape. An assessment of new technology in the perspective of Agency computing is needed to determine the effective means for introducing this in our computing environment. Particular emphasis should be made on long term storage (archiving) and the ability to inexpensively store large amounts of infrequently referenced data.

Time Requirement:

As soon as practical.

Background/R&D History/References:

ORD contributed significantly to the Agency's previous efforts at establishing a mass storage facility. Mass storage assessments and archiving capability have been included in the R&D problem statements of the last several years.

Benefits/Description of Output:

ODP customers would benefit from the introduction of a facility which would permit on-line access to greater amounts of data. Special requirements exist for providing a portable means for storing and accessing high volumes of Agency information. A paper outlining the specific application of mass storage technology to the Agency would be the first output from the research effort.

Policy Basis/Justification

ODP has the responsibility for providing state-of-the-art computing facilities to Agency customers. This includes capabilities for data storage.

Contact: STAT

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